IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Zuniga et al. Art Unit: 1763

Serial No.: 09/848,830 Examiner: Roberts P. Culbert

Filed : May 3, 2001 Conf. No. : 9467

Title : CARRIER HEAD WITH A MULTILAYER RETAINING RING FOR

CHEMICAL MECHANICAL POLISHING

Mail Stop Amendment

Commissioner for Patents P.O. Box 1450

Alexandria, VA 22313-1450

DECLARATION OF INVENTORS UNDER 37 C.F.R. § 1.131

Steven M. Zuniga and Thomas H. Osterheld, hereby declare:

- Steven M. Zuniga and Thomas H. Osterheld are inventors of the claims in the above-captioned patent application.
- Lawrence M. Rosenberg is deceased. The invention of Lawrence M. Rosenberg is no longer being claimed as a result of the accompanying amendment of the claims.
- Steven M. Zuniga has been an employee of Applied Materials, Inc. since August 1994.
- Thomas H. Osterheld has been an employee of Applied Materials, Inc. since September 1995.
- In a non-final Office Action dated October 19, 2005, the claims were rejected as being unpatentable over U.S. Patent No. 6,068,548 ("Vote"). Vote was filed on December 17, 1997, and on its face does not claim priority to an earlier filed application or patent.

CERTIFICATE OF MAILING BY FIRST CLASS MAIL

I hereby certify under 37 CFR §1.8(a) that this correspondence is being deposited with the United States Postal Service as first elass mail with sufficient postage on the date indicated below and is addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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Attorney's Docket No.: 05542-303002 / 002834 USA C

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6. On or before December 17, 1997, in the United States, Steven M. Zuniga and Thomas H. Osterheld conceived of a retaining ring for use in a carrier head, e.g., in chemical mechanical polishing system. The retaining ring includes a generally annular lower portion having a bottom surface for contacting a polishing pad during polishing and a generally annular upper portion having a bottom surface secured to the lower portion and a top surface configured to be mechanically affixed to and abut a rigid base of a carrier head. The lower portion is made of a plastic, and the upper portion is made of a metal which is more rigid than the plastic.

- 7. As evidence of conception and reduction to practice, Exhibits 1-3 are copies of CAD drawings prepared on or before December 17, 1997 by Steven Zuniga. Exhibit 1 includes a cross-sectional side view showing the upper and lower rings; Exhibit 2 includes a plan view and cross-sectional side view showing the lower ring; and Exhibit 3 includes a plan view and cross-sectional side view showing the upper ring. Exhibit 4 is a copy of a page from a presentation on or before December 17, 1997 in which Steven Zuniga prepared the bullet points. Exhibit 5 is a copy of a page from a presentation on or before December 17, 1997 by Tom Osterheld, the lead process engineer on the "composite ring" project, showing data from testing of the claimed retaining ring.
- The following table shows the support in the Exhibits for the claimed invention as recited in independent claim 13.

Claim 13 Limitations	Support for Conception
A retaining ring for a carrier head having a	Exhibits 1-3 illustrate the retaining ring,
mounting surface for a substrate	"BONDED RING" refers to the retaining ring. ASSEMBLY BONDED RING
	Exhibit 4, discusses "retaining ring"; "Titan
	Head" refers to Applied Materials carrier head.
a generally annular lower portion having a	The plan view in Exhibit 2 shows the lower
bottom surface for contacting a polishing pad	portion as annular.
during polishing,	

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	Exhibit 4, describes a "wear surface", indicating that the bottom surface contacts the polishing pad during polishing
the lower portion made of a plastic;	Exhibit 2 provides that the material of the lower ring is PPS. water '
a generally annular upper portion	Exhibit 3 shows upper portion as annular.
having a bottom surface secured to the lower portion	Exhibit 1, illustrates the bottom surface of the upper ring contacting the lower portion and states "BOND WITH LOCTITE DEPEND 330 ADHESIVE".

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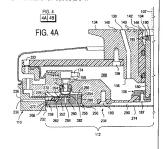
BOND WITH LOCTITE DEPEND 330 ADHESIVE PER MANUFACTURER'S INSTRUCTIONS

and a top surface configured to be mechanically affixed to and abut a rigid base of a carrier head,

Exhibits 1 and 3 show the top surface of retaining ring.



The complex shape of the top surface was configured to abut a base in the carrier head, e.g., in a manner similar to how the top surface of the completely plastic ring abutted the base in the carrier as shown in Figures 4A-4B of U.S. Patent No. 6,183,354.



wherein the upper portion is made of a metal which is more rigid than the plastic.

Exhibit 3 provides that the material of the upper ring is 303 SST. "SST" refers to stainless steel.

HAT'L 303 SST

Exhibit 4 states "metal backing"

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Stainless steel is more rigid than
polyphenylene sulfide.

- On or before December 17, 1997 a retaining ring having a metal upper portion and a plastic lower portion was reduced to practice by being constructed and tested.
- 10. As evidence of reduction to practice, Exhibit 4 states "8 prototypes fabricated". These prototypes included rings meeting the limitations of claim 1. Exhibit 4 further states "Rigid bonded giving good performance". This refers to testing of the two-part retaining rings.
- 11. As further evidence of reduction to practice, Exhibit 5 shows data, specifically a polishing profile, from test polishing of a wafer using the claimed retaining ring.
- The dates in Exhibits 1-5 have been redacted, however all the redacted dates were on or before December 17, 1997.
- 13. We hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

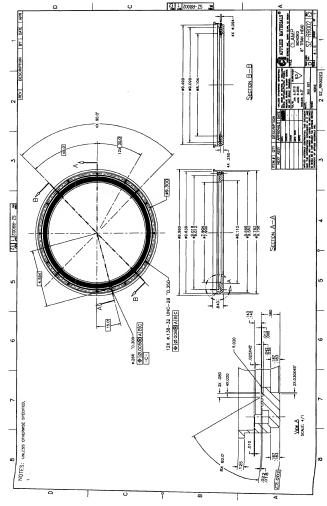
Full Name of Inventor: Steven M. Zuniga
Inventor's Signature:
Date: 12/31/2006
/ /
Full Name of Inventor: Thomas H. Osterheld Inventor's Signature:
Date: 10/31/2006

NOTES: UNLESS OTHERWISE SPECIFIED,

A BEIND WITH LOCITIE DEPEND 330 ADHESIVE
PER MANUFACTURER'S INSTRUCTIONS a В

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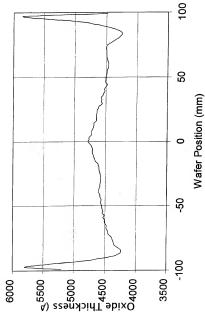
Exhibit 2



Titan Head Roadmap

- manufacturable solution is identified. Goal: Good solution "No Lap" retaining ring #1 priority for CMP group until by 10/31. Better solutions may follow.
- ring: edge exclusion relationship may result in long term EE "No lap" ring development driving understanding of retaining improvements
- ~8 prototypes fabricated
- Focusing on metal backing with PPS wear surface
- Rings with "compliance" give poor edge performance
- variability still seen in prototypes. Source of variation under Rigid bonded giving good performance - some ring to ring investigation
- "Crowned" PPS ring giving good performance





Issue: WIWNU Cannot be fixed by Retaining Ring Pressure

